

HUNTING AND PRENESTING BEHAVIOR OF THE ORANGE-BREASTED FALCON

by

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Introduction

Distribution of the Orange-breasted Falcon (*Falco deiroleucus*) extends from Veracruz, Mexico (Friedmann 1950), south into Paraguay and northern Argentina (Haverschmidt 1968). Haverschmidt (1963), Smithe (1966), and Hardy et al. (1975) indicate that *F. deiroleucus* is a tropical forest species, but observations by Howell (1972), Kirven (pers. comm.), and Short (1975) suggest that it has a wider habitat selection with a tendency to use drier regions. However, individual falcons may prefer wet cloud-forested middle altitudes along Caribbean slopes (Slud 1964).

Species observed captured or attacked throughout the falcon's range are birds usually found at forest edges and clearings. These include Red-rumped Cacique (*Cacicus haemorrhous*), Ruddy Ground-dove (*Columbia talpacoti*), Aztec Parakeet (*Aratinga astec*), Blue-crowned Parrot (*Amazona farinosa*), Red-lored Parrot (*Amazona autumnalis*), Keel-billed Toucan (*Ramphastos sulfuratos*), and Montezuma Oropendola (*Gymnostinops montezuma*). Such prey suggest that the Orange-breasted Falcon prefers ecotones, especially where complex mature forests are interrupted by savannas, clearings, high cliffs, or rivers. This habitat use is shown in Surinam where falcons perch in the upper canopy of trees at forest edges (Haverschmidt 1968). Howell observed *F. deiroleucus* perched in a dead pine located in a Nicaraguan lowland pine savanna adjacent to an extensive rain forest. Slud (1964) noted them perched at "medium height in a tree beside a road passing through partially cleared forest" and in a tree in semi-open country. Mike Parmeter (pers. comm.) observed several falcons perched in upper branches of tall dead trees along the Javari River's edge. Smithe and Paynter (1963) observed a pair in the Great Plaza, a clearing in the heart of the Mayan ruins at Tikal, Guatemala, usually perched in one of the trees adorning the temple tops. Undoubtedly *F. deiroleucus* uses the edge effect, capitalizing on high species diversity and densities there.

Methods and Materials

I watched Orange-breasted Falcons during a ten-day period at Tikal National Park, Guatemala, in early February 1976, mostly at the Great Plaza located in the heart of the Mayan ruins. I selected the upper landings of Temples I and II for viewing the falcons. These sites gave me an excellent view of the plaza below and an unobstructed view east across the top of the jungle canopy. I used 7 x 35 Bushnell binoculars and a Bausch and Lomb zoom 15-60 power spotting scope to aid my observations.

Falcon History at Tikal

At Tikal *F. deiroleucus* was apparently first recorded by E. P. Edwards in June 1958 (Smithe and Paynter 1963) in the vicinity of the Great Plaza. Smithe also observed a pair in June and July 1959 perched in a tree on one of the most prominent temples in

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the area. A pair was noted by Smithe at Tikal each year from 1958 to 1963. In 1963 the falcons nested in the roof-comb on Temple II, but Smithe did not examine the nest. They were suspected of nesting within cavities on Temples I and III in previous years.

During the early 1970s *F. deiroleucus* nested upon Temple IV, the highest pre-Columbian structure in North and South America. Concurrently, in 1972 the Bat Falcon (*Falco ruficularis*) nested in a hole in a rotted-out beam in Temple I, utilizing the Great Plaza for foraging territory (Dora Weyer pers. comm.—a long-time resident of Belize). In March 1973 Bat Falcons again nested in a rotted-out beam hole on the east wall of Temple I and foraged over the Great Plaza (Kirven pers. comm.). *F. deiroleucus* was not seen in the area in 1973; however, regurgitated pellets on top of Temple IV suggested their presence (Kirven pers. comm.). During 1974 and 1975 both falcon species occurred in the Great Plaza, and considerable interaction and harassment of *F. deiroleucus* by *F. ruficularis* took place. By February 1976 only the Orange-breasted Falcon remained in the Great Plaza. However, Bat Falcons were reported to forage along the Tikal airstrip (John Kant pers. comm.—anthropologist working at Tikal).

Hunting Behavior

Little is known concerning the behavior of *F. deiroleucus* other than "it resembles a small peregrine in habits and looks like one in flight" (Brown and Amadon 1968:847). Because of this resemblance and behavior, Short (1975) treats *F. deiroleucus* as an allo-species of *F. peregrinus*. Ridgely (1976) considers *F. deiroleucus* the neotropical ecotype of the peregrine, and Wetmore (1965) treats them only as congeners.

On the morning of 4 February 1976 in the Great Plaza, *F. deiroleucus* pursued a Blue-crowned Parrot between Temples I and II, continuing out of sight in the upper canopy of the surrounding forest. Immediately thereafter the same sequence was repeated with either the same Blue-crowned Parrot or another. Additional observations indicated that this repetitive pursuit behavior was centered around the Great Plaza. In the following days active pursuits of prey were carried out regularly through, around, and above the Great Plaza.

Fortunately for my observational purposes, the adult falcons chose to perch in a tree just north of Temple I at the same height as the upper landing of the Temple. The falcons' preferred perch was in the middle of the tree, consistent with Slud's (1974) observation. Haverschmidt (1968), however, reported that *F. deiroleucus* perched at the top of a tree. The perched falcons generally faced east with an unobstructed view toward the Tikal airstrip. The view from atop Temple I to the west was blocked at the clearing edge by giant trees. Therefore an expansive view to the east would appear to be more advantageous to the falcons for prey identification and selection. In fact, prey approaching from the east was often pursued in the immediate vicinity of the Great Plaza.

I saw the female falcon attack prey around the Great Plaza thirteen times, the male eight times. The female successfully struck a Red-lore Parrot in flight but did not hold onto it. She unsuccessfully attacked other Red-lore Parrots, Montezuma Oropendolas, Blue-crowned Parrots, Keel-billed Toucans, and an unidentified species of parakeet. The male attacked Red-lore Parrots and Blue-crowned Parrots. The falcons attacked the parrots as they flew by the Great Plaza near the upper jungle canopy. Toucans and Oropendolas were attacked as they tried to cross the Great Plaza moving from tree to tree through, rather than above, the canopy. I therefore did not see the falcons catch any prey; attacks initiated in the Great Plaza may have been made in defense of the nest site.

Prey avoided capture by outmaneuvering the falcons or seeking shelter in the foliage. By simply flying into the foliage of the trees the Toucans and Oropendolas eluded capture since the falcons would not pursue them into the trees. Red-ored Parrots managed to escape capture when closely pursued by actually flying at high speed directly into the foliage—crashing rather awkwardly and apparently at considerable danger to themselves. The evasive tactic of ‘ditching’ is similar to what I have seen the Dunlin (*Erolia alpina*) and Western Sandpiper (*Ereunetes mauri*) do when closely pursued by falcons at Humboldt Bay in northern California. The only difference is that the Dunlins and sandpipers escape capture (sometimes) by diving at high speed into water rather than into trees.

Three types of attacking flights were observed. The first type was a direct pursuit around the periphery of the Great Plaza, through and above the upper jungle canopy. The prey, only a few meters in front of pursuing falcons, executed evasive moves that were followed closely by the falcons. The second type of attack was a direct flight at the prey interspersed with short stoops or dives. The intended prey usually evaded the falcons at the critical moment of impact. The final attack technique was a spectacular vertical stoop initiated approximately 300 meters above the jungle canopy and ending with the falcon disappearing below the tree tops. Only the male dived in this fashion, twice in the area of the Tikal access road. Apparently, the falcons forage over jungle edges from high overhead. On 9 February at 1330 hours at the government-provided tourist camp, the male Orange-breasted Falcon flew through the camp clearing at mid-tree height at high velocity. They may also hunt man-made clearings (other than the Mayan ruins), such as roads, airstrips, and campgrounds.

The Orange-breasted Falcons defended the airspace directly above the Great Plaza from invasion by other Falconiforms. A Hawk-Eagle (*Spizaetus sp.* or *Spizastur*), which flew high over the plaza, was attacked by the male falcon. The falcon gained altitude quickly and disappeared as the Hawk-Eagle set its wings and immediately left the area. King Vultures (*Sarcoramphus papa*) that flew high over the Great Plaza were not attacked by the falcons.

Courtship

The male was observed with an unidentifiable bird in his talons on 8 February 1976 while perched on the roof-comb of Temple II. The female immediately flew to his perch, causing him to fly to another perch. For the next 30 minutes she pursued him from perch to perch around the Great Plaza. The male was able to consume portions of prey only when the female temporarily interrupted her harrassment by pursuing Montezuma Oropendolas and Toucans. Finally she flew above him, circled several times with her legs and feet extended when directly above him, and then flew to a tree snag where she perched and called. The male then flew to Temple I, with the remainder of the prey, landed, and called. Suddenly the male flew without the prey directly to the female and landed on her back. Copulation lasted two to three seconds. The male then flew off, circled over the North Acropolis, calling, and returned to perch next to her. One other copulation was observed on 9 February in the same snag. This time at the end of copulation the female flew from the tree and returned to perch next to the male.

Nests and Their Selection

In February 1976 both adult falcons inspected vertical slots in the roof-combs of Temples I and II by walking along the upper ledges. The slots are located both to the

right and left of center at the top of the temples. The female falcon usually led the pair to the slots for inspection, or she went alone. She preferred the southern slot of Temple I. The male occasionally accompanied her to the slots, but he rarely led the inspection or inspected the slots himself. Smithe (1963) and Weyer (pers. comm.) noted *F. deiroleucus* nesting in cavities in the roof-combs. However, the slots that the falcons were inspecting in February 1976 did not appear to have any overhead protection (as would cavities).

I could not confirm nesting at Tikal in 1976. Interestingly, the falcons seemed not to spend evenings in the Great Plaza (unless they returned after dark and left before sunrise). The falcons always heralded their arrival with a series of calls as they approached the Great Plaza early in the morning. Temple III was not checked at sunset for roosting falcons. Temple IV was climbed at sunset in the hope that the falcons may have roosted there. Others, aware of my study, reported the falcons on Temple IV near sunset. Unfortunately, the falcons did not arrive at sunset while I was there.

Human Disturbance

The falcons were not disturbed by tourists and park employees wandering around the Great Plaza near their roosting trees or by me when I climbed to within 75 meters of their perch. The only detectable human disturbance occurred when a vendor rolled his cart up the Great Plaza access road which leads directly below the falcons' perch. The loud noise of the approaching cart caused the falcons to cackle and peer down at the approaching vendor. They did not flush, and after the cart passed, they remained quietly perched.

A Minor Controversy

Griscom (1932) has been criticized by Ridgely (1976) and Wetmore (1965) for reporting *F. deiroleucus* as nesting in "cathedral and church towers and in belfries in the heart of towns and cities in both Nicaragua and western Panama." Ridgely and Wetmore believe that the Bat Falcon was the species noted by Griscom. However, Smithe and Paynter observed *F. deiroleucus* nesting in the Great Plaza, which is similar to many Latin American church towers and cathedrals located on or near open town squares. Also, my observations of one pair's tolerance of humans suggests the species may comfortably occupy urban areas containing suitable habitat. Temporal differences in use of these areas by competitors may occur as evidenced by the congeneric interaction between the Orange-breasted Falcon and Bat Falcon at Tikal.

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HAWK MT. RESEARCH AWARD

The board of directors of the Hawk Mountain Sanctuary Association announces its third annual award for raptor research. Jane E. Anderson graduate research assistant, Arizona Cooperative Wildlife Research Unit, University of Arizona, Tucson, Arizona, is this year's recipient. Miss Anderson's study, "Influence of Range Conditions on Hunting Areas of Red-tailed Hawks and Kestrels," is a much-needed investigation demonstrating the relationship between grazing intensity and raptor ecology. This basic research will be important in future management practices on grazing lands, particularly on BLM land use by private cattle interests.

To apply for the \$500.00 annual award, students should submit a description of their research program, a curriculum vitae, and two letters of recommendation by October 31, 1980, to:

Mr. Alexander C. Nagy, Curator
Hawk Mountain Sanctuary Association
Route 2, Kempton, Pennsylvania
19529

The final decision by the board of directors will be made in February 1981.

Only students enrolled in a degree-granting institution are eligible. Both undergraduate and graduate students are invited to apply. Projects will be picked completely on the basis of their potential contribution to improve understanding of raptor biology and their ultimate relevance to conservation of North American hawk populations.